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TO



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with GENE STONE

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WHAT TO EAT TO ADD YEARS TO YOUR LIFE

CHAPTER 10

How Not to Die from Kidney Disease

Letters and e-mails from patients never fail to inspire me. One note that came to mind as I was writing this chapter was from Dan, a retired NFL player. I first met him when he was forty-two. Even at that relatively young age, the former professional athlete was already taking three separate blood pressure medications. Still, his blood pressure was elevated. He was a little overweight, maybe by twenty-five pounds. He and his significant other waited around after one of my talks to see me.

Dan's physician had just told him that his kidneys were starting to show signs of damage due to his blood pressure. The first thing I asked was if he was taking his medication as prescribed, since many people skip their blood pressure medications because of their unpleasant side effects. Yes, he assured me, he was. He showed me a checklist he carried around to keep track of his medication. He asked me what supplements he could add to the list to help his kidneys.

I told him that no matter what he might have seen on the Internet, there's no such magic pill, but if he filled up his plate with lots of whole, healthy foods each day, the damage might be stopped or even reversed. Well, Dan took this advice to heart (and to kidney!), and he allowed me to share his e-mail:

Well, I went home that night and we cleaned house. Got rid of everything that didn't grow out of the ground, everything processed. And guess what, over the next year, I lost my beer belly *and* the high blood pressure. Life is so much better without those medications—they made me feel so tired all the time. And my kidney function is back to normal. It makes me mad that no one told me this sooner and that I had to feel so bad before I felt better.

It's easy to take your kidneys for granted, but they work around the clock, like a high-tech, nonstop water filter for your blood. They process up to 150 liters of blood every twenty-four hours just to make the 1–2 liters of urine you pee out each day.

If your kidneys do not function properly, metabolic waste products can accumulate in the blood and eventually lead to such symptoms as weakness, shortness of breath, confusion, and abnormal heart rhythms. Most people with deteriorating kidney function, however, don't experience any symptoms at all. If your kidneys fail completely, you will either need a new one (i.e., need a kidney transplant) or have to go on dialysis, a process by which a machine artificially filters the blood. But kidney donors are in short supply, and the average life expectancy of a person on dialysis is less than three years.¹ It's better to keep your kidneys healthy in the first place.

Although your kidneys can fail suddenly in response to certain toxins, infections, or urinary blockage, most kidney disease is characterized by a gradual loss of function over time. A national survey found that only 41 percent of Americans tested had normal kidney function, a drop from 52 percent about a decade earlier.² Approximately one in three Americans over the age of sixty-four may suffer from chronic kidney disease (CKD),³ though three-quarters of the millions affected may not even know they have it.⁴ More than half of American adults currently aged thirty to sixty-four are expected to develop chronic kidney disease during their lifetimes.⁵

Why, then, aren't millions of people on dialysis? Because kidney malfunction can be so damaging to the rest of the body that most people don't live long enough to reach that stage. In a study in which more than a thousand Americans over age sixty-four with CKD were followed for a decade, only one in twenty developed end-stage kidney failure. Most of the others had already died, with cardiovascular disease killing more than all other causes combined.⁶ That's because our kidneys are so critical to proper heart function that patients under age forty-five with kidney failure can be a hundred times more likely to die of heart disease than those with working kidneys.⁷

The good news? The diets that are healthiest for our hearts—those centered around unprocessed plant foods—may be the best way to prevent and treat kidney disease as well.

Damaging Your Kidneys with Diet

Kidneys are highly vascular organs, meaning they're packed with blood vessels, which is why they look so red. We've already seen that the standard

American diet can be toxic to blood vessels in the heart and the brain—so what might it be doing to the kidneys?

Putting that question to the test, researchers at Harvard University followed thousands of healthy women, their diets, and their kidney function for more than a decade⁸ to look for the presence of protein in the women's urine. Healthy kidneys work hard to retain protein and other vital nutrients, preferably filtering toxic or useless wastes out of the bloodstream via our urine. If the kidneys are leaking protein into urine, it's a sign that they may be starting to fail.

The researchers found three specific dietary components associated with this sign of declining kidney function: animal protein, animal fat, and cholesterol. Each of these is found in only one place: animal products. The researchers found no association between kidney function decline and the intake of protein or fat from plant sources.⁹

One hundred and fifty years ago, Rudolf Virchow, the father of modern pathology, first described fatty degeneration of the kidney.¹⁰ This concept of lipid nephrotoxicity, or the idea that fat and cholesterol in the bloodstream could be toxic to the kidneys, has since been formalized,¹¹ based in part on studies that found plugs of fat clogging up the works in autopsied kidneys.¹²

The link between cholesterol and kidney disease has gained such momentum in the medical community that cholesterol-lowering statin drugs have been recommended to slow its progression.¹³ But wouldn't it be better (not to mention safer and cheaper) to treat the underlying cause of the disease by eating healthier?

Which Type of Protein Is Better for Our Kidneys?

In the two decades between 1990 and 2010, the leading causes of death and disability remained relatively constant. As noted in chapter 1, heart disease is still the leading cause of loss of health and life. Some diseases, such as HIV/AIDS, have slid down the list, but among the diseases whose incidence has increased the most over the past generation is chronic kidney disease. The number of deaths has doubled.¹⁴

This has been blamed on our “meat-sweet” diet.¹⁵ Excess table sugar and high-fructose corn syrup consumption is associated with increased blood

pressure and uric acid levels, both of which can damage the kidney. The saturated fat, trans fat, and cholesterol found in animal products and junk food are also associated with impaired kidney function, and meat protein increases the acid load to the kidneys, boosting ammonia production and potentially damaging our sensitive kidney cells.¹⁶ This is why a restriction of protein intake is often recommended to chronic kidney disease patients to help prevent further functional decline.¹⁷

But all protein isn't created equal. It's important to understand that not all protein has the same effect on your kidneys.

High animal protein intake can have a profound influence on normal human kidney function by inducing a state called hyperfiltration, a dramatic increase in the workload of the kidney. Hyperfiltration isn't harmful if it occurs only occasionally. We all have built-in reserve kidney function—so much so that people can live with only one kidney. The human body is thought to have evolved the capacity to handle intermittent large doses of protein from our remote hunting and scavenging days. But now many of us are ingesting large doses of animal protein day after day, forcing our kidneys to call on their reserves continuously. Over time, this unrelenting stress may explain why kidney function tends to decline as people age, predisposing even otherwise healthy people to progressive deterioration of kidney function.¹⁸

The reason those who eat a plant-based diet appear to have better kidney function was originally thought to be due to their lower overall protein intake.¹⁹ However, we now know that it's more likely due to the fact that the kidneys appear to handle plant protein very differently from animal protein.²⁰

Within hours of consuming meat, your kidneys rev up into hyperfiltration mode. This is true of a variety of animal proteins—beef, chicken, and fish appear to have similar effects.²¹ But an equivalent amount of plant protein causes virtually no noticeable stress on the kidneys.²² Eat some tuna, and within three hours, your kidney filtration rate can shoot up 36 percent. But eating the same amount of protein in the form of tofu doesn't appear to place any additional strain on the kidneys.²³

Could substituting plant protein for animal protein help slow the deterioration of kidney function? Yes, half a dozen clinical trials have shown that plant protein replacement can reduce hyperfiltration and/or

protein leakage,^{24,25,26,27,28,29} but all these studies were short term, lasting fewer than eight weeks. It wasn't until 2014 that a six-month, double-blind, randomized, placebo-controlled clinical trial was performed examining how the kidneys process soya protein versus dairy protein. Consistent with the other studies, plant protein was found to help preserve function in ailing kidneys.³⁰

Why does animal protein cause the overload reaction while plant protein doesn't? Because of the inflammation animal products can cause. Researchers discovered that after giving study subjects a powerful anti-inflammatory drug along with animal protein, the hyperfiltration response and protein spillage disappeared.³¹

Reducing Dietary Acid Load

Another reason animal protein may be so detrimental to kidney function is that it is generally more acid forming. This is because animal protein tends to have higher levels of sulfur-containing amino acids, such as methionine, which produce sulfuric acid when metabolized in the body. Fruits and vegetables, on the other hand, are generally base forming, which helps neutralize acids in our kidneys.³²

Dietary acid load is determined by the balance of acid-inducing foods (such as meats, eggs, and cheese) and base-inducing foods (such as fruits and vegetables). A 2014 analysis of the diets and kidney function of more than twelve thousand Americans across the country found that a higher dietary acid load was associated with significantly higher risk of protein leakage into the urine, an indicator of kidney damage.³³

Ancient human diets largely consisted of plants, so they likely produced more base than acid in the kidneys of our ancestors. Humans evolved eating these alkaline (base-forming) diets over millions of years. Most contemporary diets, on the other hand, produce acid in excess. This switch from base- to acid-forming diets may help explain our modern epidemic of kidney disease.³⁴ Acid-inducing diets are believed to impact the kidney through "tubular toxicity," damage to the tiny, delicate, urine-making tubes in the kidneys. To buffer the excess acid formed by your diet, kidneys produce ammonia, which is a base and can neutralize some of that acid. Counteracting the acid is beneficial in the short term, but over the long run, all the extra ammonia in the kidneys may have a toxic effect.³⁵ The decline

in kidney function over time may be a consequence of a lifetime of ammonia overproduction.³⁶ Kidneys may start to deteriorate in your twenties,³⁷ and by the time you reach your eighties, you may be down to half capacity.³⁸

The chronic, low-grade, metabolic acidosis attributed to a meat-rich diet³⁹ helps explain why people eating plant-based diets appear to have superior kidney function⁴⁰ and why various plant-based diets have been so successful in treating chronic kidney failure.^{41,42} Under normal circumstances, a vegetarian diet alkalinizes the kidneys, whereas a nonvegetarian diet carries an acid load. This proved to be true even among vegetarians who consumed processed meat substitutes, such as veggie burgers.⁴³

If people are unwilling to reduce their meat consumption, they should be encouraged to eat more fruits and vegetables to balance out that acid load.⁴⁴ “However,” one kidney doctor editorialized, “many patients find it difficult to follow a diet high in fruits and vegetables and might therefore be more adherent to a supplement.”⁴⁵

So what did researchers try? Giving people bicarbonate of soda (sodium bicarbonate) pills. Instead of treating the primary cause of the excess acid formation (too many animal products and too few fruits and vegetables), they preferred to treat the consequences. Too much acid? Here’s some base to neutralize it. Sodium bicarbonate can effectively buffer the acid load,⁴⁶ but, rather obviously, sodium bicarbonate contains sodium, which over the long term may itself contribute to kidney damage.⁴⁷

Unfortunately, this type of sticking-plaster approach is all too typical of today’s medical model. Cholesterol too high from eating a diet unnaturally high in saturated fat and cholesterol? Take a statin drug to cripple your cholesterol-making enzyme. Diet unnaturally high in acid-forming foods? Swallow some bicarbonate of soda pills to balance that right out.

These same researchers also tried giving people fruits and vegetables instead of bicarbonate of soda and found that they offered similar protections, with the additional advantage of lowering the subjects’ blood pressure. The title of the accompanying commentary in the medical journal was telling: “The Key to Halting Progression of CKD Might Be in the Produce Market, Not in the Pharmacy.”⁴⁸

Kidney Stones

Eating a plant-based diet to alkalinize your urine may also help prevent and treat kidney stones—those hard mineral deposits that can form in your kidneys when the concentration of certain stone-forming substances in your urine becomes so high they start to crystallize. Eventually, these crystals can grow into pebble-sized rocks that block the flow of urine, causing severe pain that tends to radiate from one side of the lower back toward the groin. Kidney stones can pass naturally (and often painfully), but some become so large that they have to be removed surgically.

The incidence of kidney stones has increased dramatically since World War II⁴⁹ and even just in the last fifteen years. Approximately one in eleven Americans are affected today, compared with one in twenty less than two decades ago.⁵⁰ What accounts for this rising incidence? The first clue to an answer came in 1979 when scientists reported a striking relationship between the prevalence of kidney stones since the 1950s and increasing consumption of animal protein.⁵¹ As in all observational studies, though, the researchers couldn't prove cause and effect, so they decided to perform an interventional trial: They asked the subjects to add extra animal protein to their daily diets, the equivalent of about an extra tin's worth of tuna fish. Within two days of eating the extra tuna, the levels of stone-forming compounds—calcium, oxalate, and uric acid—shot up such that the subjects' kidney-stone risk increased 250 percent.⁵²

Note the experimental “high” animal protein diet was designed to re-create the animal protein intake of the average American,⁵³ suggesting that Americans could considerably lower their risk of kidney stones by lowering their meat intake.

By the 1970s, enough evidence had accumulated that researchers began to ask whether people suffering from recurrent kidney stones should stop eating meat altogether.⁵⁴ A study on the kidney stone risk of vegetarians wasn't published until 2014, though. Oxford University researchers found that subjects who didn't eat meat at all had a significantly lower risk of being hospitalized for kidney stones, and for those who did eat meat, the more they ate, the higher their associated risk.⁵⁵

Is some meat worse than others? People who form kidney stones are commonly advised to restrict their intake of red meat, but what about chicken or fish? We didn't know until another 2014 study compared salmon

and cod to chicken breasts and burgers. It found that gram for gram, fish might be slightly worse than other meat in terms of the risk of certain kidney stones, but they concluded that overall, “[s]tone formers should be counseled to limit the intake of all animal proteins.”⁵⁶

Most kidney stones are composed of calcium oxalate, which forms like a stick of rock when urine becomes supersaturated with calcium and oxalates. For many years, doctors assumed that because the stones are made of calcium, they should counsel their patients to simply reduce their calcium intake.⁵⁷ As with so much in medicine, clinical practice often flies blind without solid experimental support. This changed with a landmark study, published in the *New England Journal of Medicine*, which pitted the traditional, low-calcium diet against a diet low in animal protein and sodium. After five years, the study found that eating less meat and salt was about twice as effective as the conventionally prescribed low-calcium diet, cutting kidney-stone risk by half.⁵⁸

What about cutting down on oxalates, which are concentrated in certain vegetables? Reassuringly, a recent study found there was no increased risk of stone formation with higher vegetable intake. In fact, greater intake of fruits and vegetables was associated with a reduced risk independent of other known risk factors, meaning there may be additional benefits to bulking up on plant foods above and beyond restricting animal foods.⁵⁹

Another reason a reduction in animal protein is helpful is that it lowers uric acid buildup, which can form crystals that seed calcium stones or form stones all by itself. Indeed, uric acid stones are the second most common type of kidney stones. So it makes sense that to reduce your risk, you should try to reduce excess uric acid production. This can be accomplished either of two ways: by adding drugs or by subtracting meat.⁶⁰ Uric acid-blocking medications like allopurinol may be effective, but they can have serious side effects.⁶¹ On the other hand, removing all meat from a standard Western diet appears to reduce the risk of uric acid crystallization by more than 90 percent within as few as five days.⁶²

Bottom line: When urine is more alkaline, stones are less likely to form. This helps explain why less meat and more fruits and vegetables appear so protective. The standard American diet yields acidic urine. When people are placed on a plant-based diet, however, their urine can be alkalinized up to a near neutral pH in less than a week.⁶³

Not all plant foods are alkalinizing, though, and not all animal foods are equally acidifying. The LAKE (Load of Acid to Kidney Evaluation) score takes into account both the acid load of foods and their typical serving sizes in order to help people modify their diets for the prevention of kidney stones and other acid-related diseases, such as gout. As you can see in figure 4, the single most acid-producing food was fish, including tuna, followed by pork, poultry, cheese, and beef. Eggs are actually more acid producing than beef, but people tend to eat fewer of them at one sitting. Some grains can be a little acid forming, such as bread and rice, but not pasta, interestingly. Beans are significantly acid *reducing*, but not as much as fruits are, with vegetables crowned the most alkaline forming of foods.⁶⁴

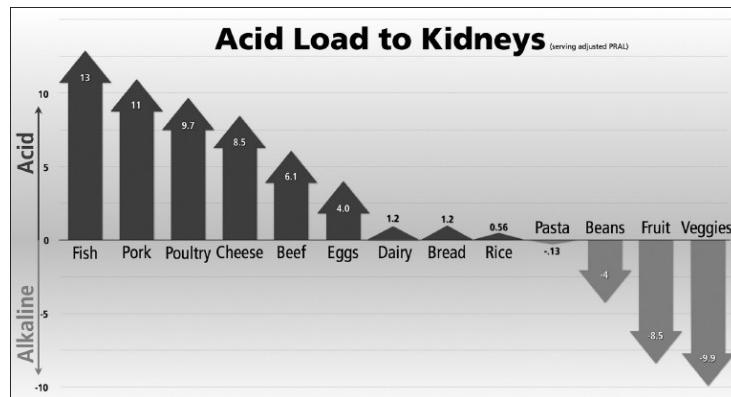


Figure 4

Dietary changes can be so powerful they can not only help prevent kidney stones but also, in some cases, cure them without drugs or surgery. Uric acid stones can apparently be dissolved away completely with a combination of eating more fruits and vegetables, restricting animal protein and salt intake, and drinking at least ten glasses of fluid a day.⁶⁵

Testing Your “Pee-H” with Purple Cabbage

We know that the average Western diet is acid producing, while the average plant-based diet is acid reducing.⁶⁶ Eating an acid-forming diet can not only affect kidney stone risk but may also produce the systemic, chronic, low-grade metabolic acidosis⁶⁷—excess acid in the bloodstream—that is thought to contribute to muscle breakdown as you age.⁶⁸ So what’s the best way to determine how acid forming your diet really is? Perhaps the easiest (and most boring) method is to order some pH paper strips to pee on. Alternatively, why not use what you (should) have right now in your

refrigerator: purple cabbage. Purple, or red, cabbage provides one of the single best nutritional bangs for your buck, and you can even use it to perform kitchen chemistry experiments, or in this case, bathroom chemistry.

Boil some purple cabbage until the water turns deep purple, or blend raw cabbage with some water and then strain out the solids. Pee into your toilet then take your purple-cabbage cocktail and pour it into the toilet bowl. (Low-flow toilets work best, because there's less water in the bowl.) If the liquid in the toilet bowl remains purple or, even worse, turns pink, your urine is too acidic. Blue is the target. If your pee and cabbage water turns blue, your urine is not acidic but neutral or even basic.

Preventing Excess Phosphorus Intake

Having too much phosphorus in the blood may increase the risk of kidney failure, heart failure, heart attacks, and premature death. Excess phosphorus also appears to damage our blood vessels and accelerate aging and bone loss.⁶⁹ As such, elevated levels appear to be an independent risk factor for early death among the general population.⁷⁰

Phosphorus is found in a variety of plant and animal foods. Most Americans consume about twice as much phosphorus as they need,⁷¹ but it's not just about how much you eat but how much you absorb. By switching to a plant-based diet, you can achieve a significant drop in your blood phosphorus levels even as your intake levels of the mineral remains constant.⁷² This occurs because the phosphorus in animal foods appears in the form of a compound called phosphate, which is absorbed into the bloodstream more readily than phytate, the predominant form of phosphorus in plant foods.⁷³ As you may remember from chapter 4, this situation is similar to the case of iron, another essential mineral of which you can get too much. Your body can better protect itself from absorbing too much plant-based iron, but it can't as effectively stop surplus muscle or blood-based (heme) iron from slipping through the intestinal wall.

The worst type of phosphorus, though, is that found in phosphate food additives. These phosphorus compounds are added to cola drinks and meat to enhance their color.⁷⁴ (Without added phosphate, Coca-Cola would be pitch black.⁷⁵) Less than half of most plant phosphorus⁷⁶ and about three-quarters of natural animal product phosphorus gets into your bloodstream,⁷⁷ but added phosphate can be absorbed at a rate of nearly 100 percent.⁷⁸

Phosphate additives play an especially important role in the meat industry. Chicken meat is often injected with phosphates to improve its

color, to add water weight (and thus to increase profitability since chicken can be sold by the pound), and to reduce “purge,” the term used to describe the liquid that seeps from meat as it ages.⁷⁹ The problem with this additive is that it can nearly double the phosphorous levels in meat.⁸⁰ Phosphate additives have been described as “a real and insidious danger” for kidney patients, since they have diminished capacity to excrete it,⁸¹ but given what we now know about excess phosphorus, it’s a concern for us all.

In the United States, eleven different types of phosphate salts are allowed to be injected into raw meat and poultry,⁸² a practice that’s long been banned in Europe.⁸³ This is because phosphates found in meat and processed foods are considered “vascular toxins,”⁸⁴ capable of impairing our arterial function within hours of consuming a high-phosphate meal.⁸⁵ In meat, there’s an additional food safety concern, as adding phosphate may increase the growth of leading food poisoning bacteria *Campylobacter* in poultry purge up to a millionfold.⁸⁶

It’s easy to avoid added phosphorus in processed foods—just don’t buy anything containing ingredients with the word “phosphate” in their names, including pyrophosphate and sodium triphosphate.⁸⁷ With meat, it’s more difficult to determine the phosphate content, as producers aren’t required to disclose injected additives. Added phosphate may be labeled as “flavorings” or “broth” or not labeled at all.⁸⁸ Meat already contains highly absorbable phosphates; adding more may just add insult to kidney injury. Chicken appears to be the worst offender: A supermarket survey found more than 90 percent of chicken products contained phosphate additives.⁸⁹

Who Determines Whether Food Additives Are Safe?

In 2015, the U.S. Food and Drug Administration finally announced its plans to all but eliminate trans fats from processed foods,⁹⁰ citing a CDC estimate that as many as twenty thousand heart attacks each year could be prevented by eliminating partially hydrogenated oils.⁹¹ Until June 16, 2015, trans fats enjoyed so-called GRAS status: “generally recognized as safe.”

Why were these killer fats deemed safe in the first place?

Guess who makes the “generally recognized as safe” determination? It’s not the government or a scientific body. It’s the manufacturer. You read that right. The food maker gets to determine whether or not its own product is safe for the public, a process the FDA refers to as “GRAS self-determination.” What’s more, these

manufacturers can legally add things to our food supply without informing the FDA.⁹² An estimated one thousand food-additive safety decisions have never even been reported to the FDA or the public.⁹³

But sometimes food manufacturers do notify the FDA when they introduce a new additive. Sounds responsible of them, doesn't it? Presumably they found some independent, third-party panel to evaluate the safety of their product so as to avoid a financial conflict of interest, right?

Well, not exactly.

Of all the GRAS safety determinations that were voluntarily submitted to the FDA between 1997 and 2012, 22.4 percent were made by someone directly employed by the manufacturer itself, 13.3 percent were made by someone directly employed by a firm handpicked by the manufacturer, and 64.3 percent were made by a panel either handpicked by the manufacturer or chosen by a firm hired by the manufacturer.⁹⁴ Are you doing the maths? Yes, zero food safety decisions were made independently.

How could regulators let companies decide for themselves whether the food additives they use in their own products are safe? Follow the money. Three of Washington's largest lobbying firms reportedly now work for the food industry.⁹⁵ For example, PepsiCo alone spent more than \$9 million (£5 million) in a single year to lobby Congress.⁹⁶ The deeper you dig, the less surprising it is that such food additives as trans fats have been allowed to kill thousands year after year.

But hey, according to the manufacturer, they're safe . . .

Can Diet Protect Against Kidney Cancer?

Each year, sixty-four thousand Americans are diagnosed with kidney cancer, and about fourteen thousand die from it.⁹⁷ Approximately 4 percent of these cases are hereditary,⁹⁸ but what about the other 96 percent?

Historically, the only accepted risk factor for kidney cancer has been tobacco use.⁹⁹ A class of carcinogens in cigarette smoke called nitrosamines are considered to be so harmful that even so-called thirdhand smoke is a concern. The risks of tobacco smoke do not end when a cigarette is extinguished, as residual smoke can stick to walls and other surfaces.¹⁰⁰ Around 80 percent of nitrosamines from cigarette smoke can remain in a room, even with normal ventilation,¹⁰¹ so always try to choose smoke-free hotel rooms. Nitrosamines are one of the reasons you can't smoke indoors without endangering others, even if you smoke without anyone present. As one of the leading scholars in the tobacco control movement recently wrote, "Carcinogens of this strength in any other consumer product designed for human consumption would be banned immediately."¹⁰²

Except for one: meat.

Did you know that one hot dog has as many nitrosamines (and nitrosamides, which are similar tobacco carcinogens^{[103](#)}) as four cigarettes and that these carcinogens are also found in fresh meat, including beef, chicken, and pork?^{[104](#)} This may help explain the rising rates of kidney cancer over the last few decades despite the falling rates of smoking.

Clearing the Confusion: Nitrates, Nitrites, and Nitrosamines

Although fresh meat also contains nitrosamines, processed or cured meat like deli slices may be particularly harmful. In Europe, the world's second-largest prospective study on diet and cancer calculated that a reduction in processed meat consumption to less than twenty grams a day—less than a small matchbook-sized portion—would prevent more than 3 percent of all deaths.^{[105](#)} In the largest such investigation the NIH-AARP study of more than five hundred thousand Americans (see [here](#)) found the preventable fraction of deaths may be even higher. The researchers suggested, for example, that 20 percent of heart disease deaths among American women could be averted if the highest consumers of processed meat would cut down to the equivalent of less than half a rasher of bacon a day.^{[106](#)} No wonder the American Institute for Cancer Research recommends that you simply “avoid processed meat such as ham, bacon, salami, hot dogs and sausages.”^{[107](#)}

Nitrites are added to cured meat as a “color fixative” and to help prevent the growth of botulism bacteria (a rare but serious paralytic illness).^{[108](#)} What about “uncured” bacon? It says right on the package: “No nitrites or nitrates added.” But study the fine print and you may see a little footnote that reads something like “except those naturally occurring in celery juice.” Vegetables do contain nitrates that can be fermented into nitrites, so adding fermented celery juice to bacon is just a sneaky way of adding nitrites. Even commentators in the journal *Meat Science* have realized this may be perceived by consumers as “incorrect at best or deceptive at worst.”^{[109](#)}

But the same fermentation that converts nitrates to nitrites can happen when you eat vegetables, thanks to bacteria on your tongue. So why are vegetable nitrates and nitrites okay but the same compounds from meat are linked to cancer?^{[110](#)} Because nitrites themselves are not carcinogenic; they turn into carcinogens. Nitrites only become harmful when they turn into nitrosamines and nitrosamides. For them to do that, amines and amides must be present, and amines and amides are found in abundance in animal products. This transformation can happen in the meat itself or in your stomach after you eat it. In the case of plant foods, the vitamin C and other antioxidants that are found naturally in them block the formation of these carcinogens in your body.^{[111](#)} This process would explain why intake of both nitrate and nitrite from processed meat has been linked to kidney cancer, but no increased risk was found for nitrate or nitrite intake from plant sources.^{[112](#)}

While nitrite from animal sources—not just processed meats—was associated with an increased risk of kidney cancer, some of the highest nitrate-containing vegetables,

such as rocket, kale, and collards, are associated with significantly reduced risk for kidney cancer.^{[113](#)}

Kidneys are tasked with the monumental responsibility of filtering your blood all day, every day. That's a lot of work for two fist-sized organs. Kidneys are extremely resilient, but they aren't indestructible. When they begin to fail, the body can start failing too. Toxic substances that healthy kidneys would ordinarily filter out can pass through and build up in the bloodstream.

To keep your kidneys strong and your blood clean, you must carefully consider what you eat. The meat-sweet American diet can slowly damage your kidneys one meal at a time, forcing the kidneys into a state of hyperfiltration. Imagine how long your car engine would last if you always revved it near the red line? Thankfully, medical science has proven that you can reduce your kidneys' workload (and acid load) by moving toward a more plant-based diet.

CHAPTER 11

How Not to Die from Breast Cancer

“You have breast cancer.”

These are among the most feared words a woman can hear, and for a good reason. Besides skin cancer, breast cancer is the most common cancer among American women. Every year, about 230,000 are diagnosed with breast cancer, and 40,000 die from it.¹

Breast cancer does not occur overnight. That lump you feel in the shower one morning may have started forming decades ago. By the time doctors detect the tumor, it may have been present for forty years or even longer.² The cancer has been growing, maturing, and acquiring hundreds of new survival-of-the-fittest mutations that allow it to grow even more quickly as it tries to outmaneuver your immune system.

The scary reality is that what doctors call “early detection” is actually late detection. Modern imaging simply isn’t good enough to detect cancer at its earliest stages, so it can spread long before it’s even spotted. A woman is considered “healthy” until she shows signs or symptoms of breast cancer. But if she has been harboring a malignancy for two decades, can she truly be considered healthy?

People who are doing the right thing by improving their diets in hopes of preventing cancer may in fact be successfully treating it as well. Autopsy studies have shown that as many as 20 percent of women aged twenty to fifty-four who died from unrelated causes, such as car accidents, had so-called “occult” (or hidden) breast cancers growing inside them.³ Sometimes there’s nothing you can do to prevent the initiation stage of cancer, when that first normal breast cell mutates into a cancerous one. Some breast cancers may even start in the womb and be related to your mother’s diet.⁴ For this reason, we all need to choose a diet and lifestyle that not only prevents the initiation stage of cancer but also hampers the promotion stage, during which the cancer grows to a size large enough to pose a threat.

The good news is that no matter what your mum ate or how you lived as a child, by eating and living healthfully, you may be able to slow the growth rate of any hidden cancers. In short, you can die *with* your tumors rather than *from* them. This is how dietary cancer prevention and treatment can end up being the same thing.

One or two cancer cells never hurt anyone. But how about a billion cancer cells? That's how many may be in a tumor⁵ by the time it's picked up by a mammogram.⁶ Like most tumors, breast cancer starts with just one cell, which divides to become two, four, and then eight. Every time breast cancer cells divide, the tumor can effectively double in size.⁷

Let's see how many times a tiny tumor has to double to get to a billion cells. Take out a calculator. Multiply one times two. Then multiply that number by two. Keep doing that until you reach one billion. Don't worry. It won't take long. It's only thirty doublings. In just thirty doublings, a single cancer cell can turn into a billion.

The key to how quickly you'd be diagnosed with cancer, then, is the doubling time. How long does it take tumors to double once? Breast cancers can double in size in anywhere from as few as twenty-five days⁸ to a thousand days or more.⁹ In other words, it could be two years, or it could be more than a hundred years, before a tumor starts to cause problems.

Where you fall on that timescale—two years or a century—may depend in part on what you eat.

When I was teen, I ate a lousy diet. One of my favorite meals was—no joke—chicken-fried steak. During my youth, I may have caused one of the cells in my colon or prostate to mutate. But I've been eating much healthier for the last twenty-five years. My hope is that even if I did initiate a cancerous growth, if I don't promote it, I may be able to slow down its growth. I don't care if I get diagnosed with cancer a hundred years from now. I don't expect to be around at that point to worry about it.

Current controversy over the cost and effectiveness of mammograms¹⁰ misses an important point: Breast cancer screening, by definition, does not prevent breast cancer. It can just pick up existing breast cancer. Based on autopsy studies, as many as 39 percent of women in their forties already have breast cancers growing within their bodies that may be simply too small to be detected by mammograms.¹¹ That's why you can't just wait until diagnosis to start eating and living healthier. You should start tonight.